AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the

application.

1 - 30   (Cancelled).

31.   (Currently Amended) A multiple store buffer forwarding apparatus, comprising:

a processor having a write combining buffer, and

a non-volatile memory coupled to the processor, said non-volatile memory storing

instructions which when executed by the processor cause the processor to:

execute a plurality of store instructions referencing a first memory region;

execute a load instruction referencing a second memory region;

determine that the second memory region matches a cacheline address;

determine that the first memory region completely covers the second memory region; and

transmit a store forward is OK signal to indicate the first memory region completely

covers the second memory region.

32.   (Previously Presented) The multiple store buffer forwarding apparatus of claim 31,

wherein the write combining buffer includes:

a comparator to receive and compare an address of the second memory region with all

existing cacheline addresses in the write combining buffer,

an address and data buffer coupled to the comparator,

a data valid bits buffer coupled to the address and data buffer,

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a multiplexer coupled to the data valid bits buffer, and

a comparison circuit coupled to the multiplexer.

33.   (Previously Presented) The multiple store buffer forwarding apparatus of claim 32,

wherein the multiplexer is to:

receive a byte valid vector from the data valid bits buffer,

receive address bits from the load instruction,

select a group of valid bits from the byte valid vector, and

output the group of valid bits.

34.   (Previously Presented) The multiple store buffer forwarding apparatus of claim 33,

wherein the comparison circuit is to:

receive the group of valid bits;

receive an incoming load instruction byte mask;

determine that it is acceptable to forward the data using the group of valid bits and the

incoming load instruction byte mask; and

produce a forward OK signal.

35.   (Previously Presented) The multiple store buffer forwarding apparatus of claim 31,

wherein said processor is implemented as a multi-processor having associated with each said

multi-processor a separate set of hardware resources.

36. (Previously Presented) A multiple store buffer forwarding apparatus, comprising:

a memory;

a processor coupled to said memory and having a write combining buffer, said processor

to

execute a plurality of store instructions referencing a first memory region of said

memory;

execute a load instruction referencing a second memory region of said memory;

determine that the second memory region matches a cacheline address;

determine that the first memory region completely covers the second memory region; and

transmit a signal indicating that store buffer forwarding is authorized.

37. (Previously Presented) The multiple store buffer forwarding apparatus of claim 36,

wherein the write combining buffer includes:

a comparator to receive and compare an address of the second memory region with all

existing cacheline addresses in the write combining buffer,

an address and data buffer coupled to the comparator,

a data valid bits buffer coupled to the address and data buffer,

a multiplexer coupled to the data valid bits buffer, and

a comparison circuit coupled to the multiplexer.

38. (Previously Presented) The multiple store buffer forwarding apparatus of claim 36,

wherein the multiplexer is to:

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receive a byte valid vector from the data valid bits buffer,

receive address bits from the load instruction,

select a group of valid bits from the byte valid vector, and

output the group of valid bits.

39.   (Previously Presented) The multiple store buffer forwarding apparatus of claim 38,

wherein the comparison circuit is to:

receive the group of valid bits;

receive an incoming load instruction byte mask;

determine that it is acceptable to forward the data using the group of valid bits and the

incoming load instruction byte mask; and

produce a signal indicating that it is acceptable to forward the data.

40.   (Previously Presented) The multiple store buffer forwarding apparatus of claim 36,

wherein said processor is implemented as multiple processors wherein a separate set of hardware

resources is associated with each of said multiple processors.

41.   (Previously Presented) An apparatus, comprising:

a processor;

a write combining buffer (WCB) coupled to the processor, the WCB to combine store

data from a plurality of processor store operations into a single WCB entry;

a comparison circuit coupled to the WCB,

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the comparison circuit to receive a load operation from the processor,

the comparison circuit to compare a memory region requested by the load operation to

addresses of the store data in the WCB, and

the comparison circuit to generate a signal indicating that store buffer forwarding is

authorized for the load instruction if the memory region requested by the load operation can be

globally observed in a single atomic transaction and if the store data in the WCB completely

covers the memory region requested by the load operation.

42.   (Previously Presented) The apparatus of claim 41, wherein each WCB entry is sized to

match a system cache line size.